MOTOMAN XRC
USER'S MANUAL
MotoDDE version 3.xx

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN ROBOTICS EUROPE
A subsidiary of YASKAWA Electric Corporation

MANUAL NO. MRS55050

Revision

000115
Manual updated from old manual (ver. 2.0). New items included.
Also valid for MOTOMAN XRC. PRELIMINARY ISSUE !

021024
Minor corrections.

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MotoDDE Server

Valid for MotoDDE, ver. 3.xx (Motoman part No. 441129-99).

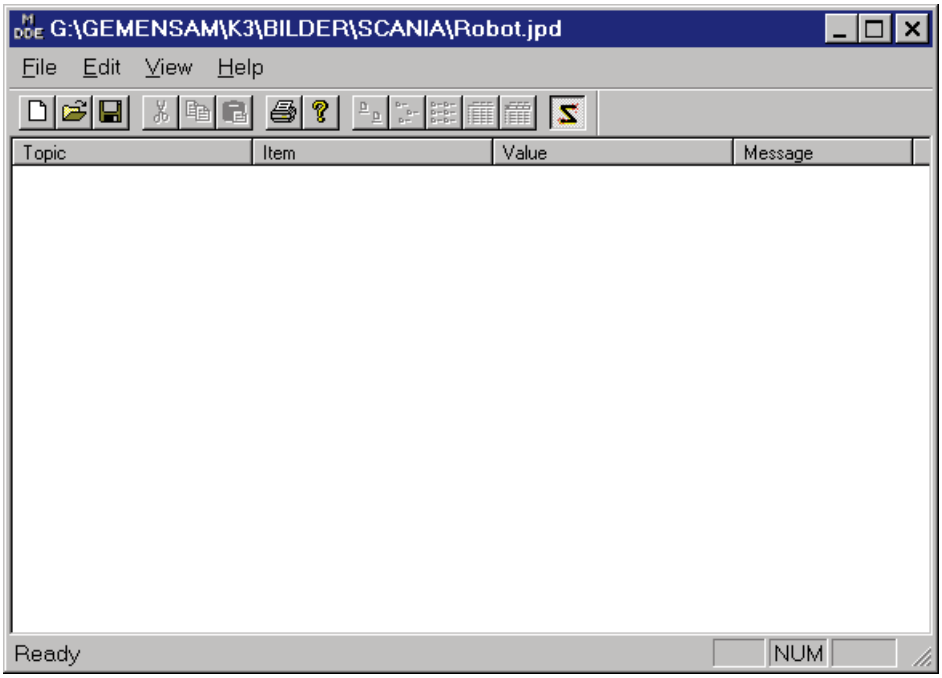


Fig.1 Main Screen

1. General

MotoDDE is a PC-program.

- ✔ Machine/Process supervision from PC.
- ✔ Interface between different application program and robot, see table.
- ✔ Communication through serial or TCP/IP (Ethernet).
- ✔ For controllers type YASNAC ERC / MRC or MOTOMAN XRC.

For more basic information about installation and handling of the software, icons, menu bars, etc. refer to the operator's manual for Windows95 or Windows NT.

This manual shall always be available to operator.
This Operator's Manual comprises information about:

- ✔ Installation / Setup / Handling / Operation

Text written in **BOLD** letters means command, icon or button.
Text written in *ITALIC* means text shown on display.

1.1 Copyright

The diskette for MotoDDE-program may not be copied or imparted to a third party nor be used for any unauthorized purpose. Copies may be done only for own backup.

This manual may not be copied or imparted to a third party nor be used for other unauthorized purpose.

1.2 MotoDDE-kit

■ ***MotoDDE-kit comprises***

✔ Installation diskettes
✔ One hardware key
✔ One manual
✔ One registration card

The basic version includes user licence for two (2) Ethernet-clients (two systems). Licence for serveral clients can be ordered as accessories (part. no. 441132).

■ ***Equipment needed for network communication***

Following equipment demands but are not included in MotoDDE-kit:

✔ YASNAC ERC / MRC or MOTOMAN XRC.
✔ Ethernet board for MRC, JANCD-MIF06, (Motoman part. no. 9050107).
✔ Tranciver, depending on the customers type of network.
✔ Cables / Adaptors

■ ***Equipment needed for serial communication***

Following equipment demands but are not included in MotoDDE-kit:

✔ YASNAC ERC / MRC or MOTOMAN XRC.
✔ Cable for serial communication (MS no. 341779-xx).

■ ***Further you may have need for:***

✔ Programming manual for your robot controller.
✔ Operator’s manual for Windows95/98 or Windows NT.

1.3 Hardware and software demands

✔ One PC type Pentium, 32 Mb RAM, 2 Mb disk space.
✔ 3,5”-diskette station, 1,44 Mb (or CD-setup)
✔ Colour monitor (not necessary).
✔ Windows 95/98 or Windows NT.
✔ Ethernetboard (at network communication).
✔ Protective hood, if the PC is installed in the workshop.

2. Software installation

Note!
This chapter shows a general installation phase of any software. In this example the software FDDWIN is installed. Select the right software by choosing the appropriate software name.

2.1 Installation

There are three ways to start installation of this software, all will give the same result. The most common way is described below.

a) Put the first diskette named #1 in the disk-drive.

b) Click on the **Start** button on the menu-bar.

c) Choose **Run** from the menu.

d) Browse to drive **A:**

e) Choose the file named **SETUP.EXE**

f) Click **OK**.

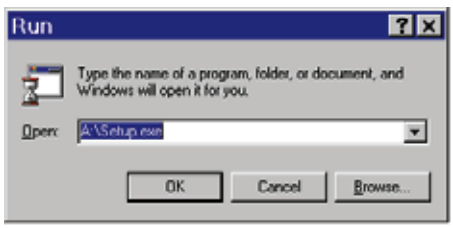


Fig.2 Choose installation file

g) Choose **OK** and the installation guide will start.

h) You can quit the installation att any time by clicking the **Cancel**-button and then confirm by **Yes**-button.

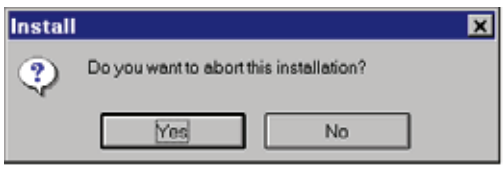


Fig.3 You can cancel installation at any time

i) Mark the language you want to use during installation. ***Note!*** This will not influence the language you use in FDDWIN32 later.

j) Click on the **OK**-button.

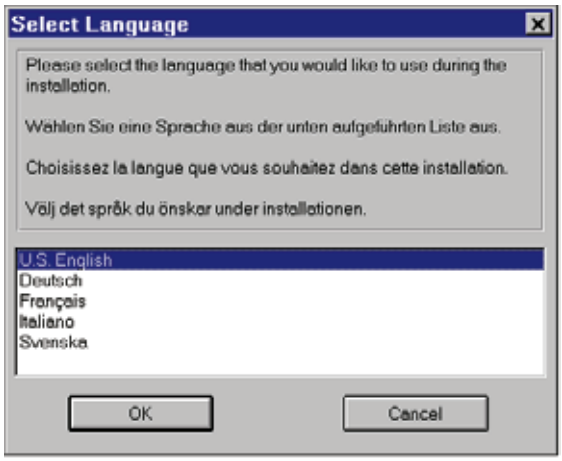


Fig.4 Language selection during installation

k) Pass this information screen by clicking the **Next**-button.

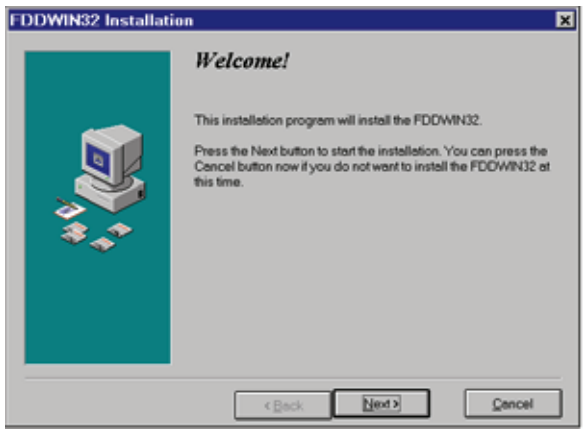


Fig.5 Information screen

l) Read through the license agreement and accept by clicking on the Next-button.

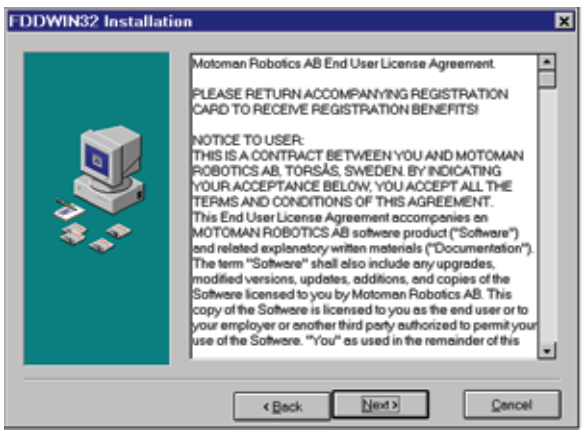


Fig.6 License agreement. Accept by clicking Next.

m) Set directory for FDDWIN32. It's advisable to install the software in the directory which is set as default by the installation guide.

n) Accept by clicking **Next**-button.

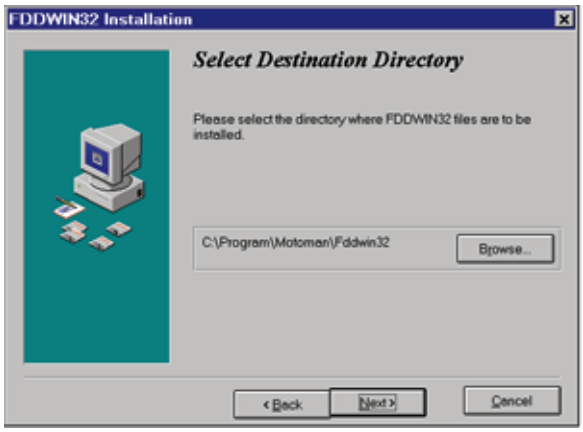


Fig.7 Choose directory

o) Accept installation process by clicking **Next**-button.

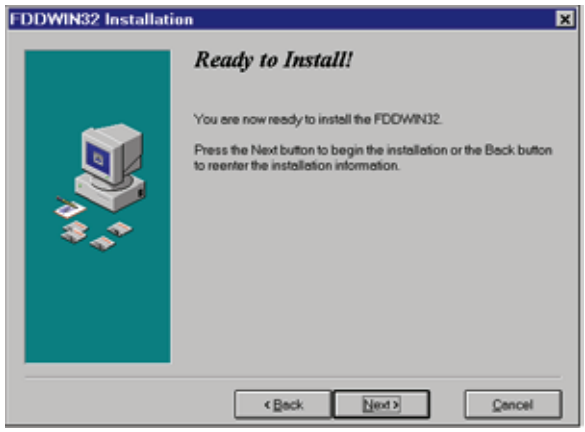


Fig.8 Start installation

p) Installation starts.

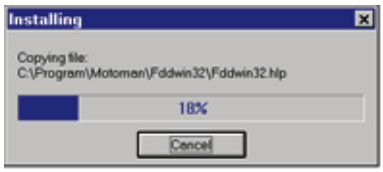


Fig.9 Installation progress counter

q) After some time you are told to enter disk #2/2.

r) Insert disk and click on OK-button.

Fig.10 Insert disk #2

s) The installation is finished and the last screen appears.

t) Accept installation by clicking the **Finish**-button.

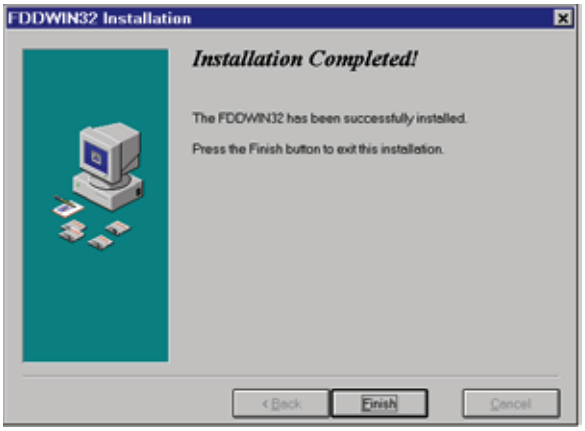


Fig.11 Installation complete

u) Before it is possible to run the software, the hardware key must be installed on the parallel port.

2.2 After installation

After installation, fill in and return the registration card to Motoman Robotics Europe AB.

During installation the main directory is automatically created and all necessary files are installed in the specified drive.

In the end of the setup a program group (MOTOMAN) and a icon is created. To start FDD for Windows just double-click on the **Start Menu**.

If you want to create a shortcut to FDDWIN32, see Windows manual for further information

2.3 Uninstall

As in all WIN95/NT softwares there are an uninstall facility if you want to remove the software from the hard disk.

a) Start the **Control panel** from the start menu. Select **Add/Remove** button from the menu.

b) Mark the line **FDDWIN32** from the menu.

c) Click **Add/Remove** button.

Fig.12 Mark the FDDWIN32 software

d) Activate uninstall guide by **Next**-button.

Fig.13 Automatic uninstall

e) End the operation by clicking the **Finish**-button.

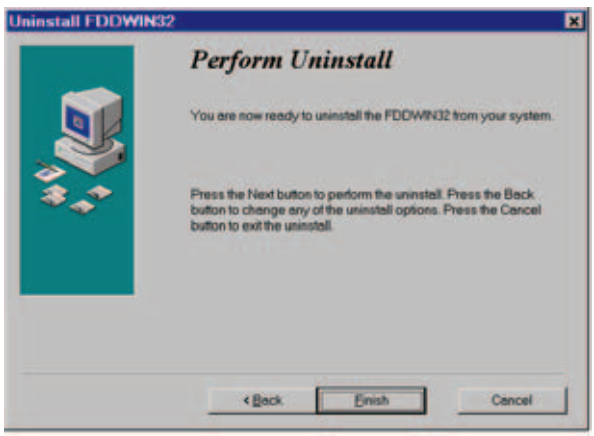


Fig.14 Uninstall

3. Communication parameters

The communication protocol is very special, (for more information see YASNAC ERC / MRC or MOTOMAN XRC computer communication User's manual.)
Communication parameters in the PC shall be set as follows:

Baud rate	*4800*	
Data bits	*8*	
Stop bits	*1*	
Parity check	*0*	*(None)*

a) Click on **Edit** in the menu.

b) Click on **Set Com Port**.

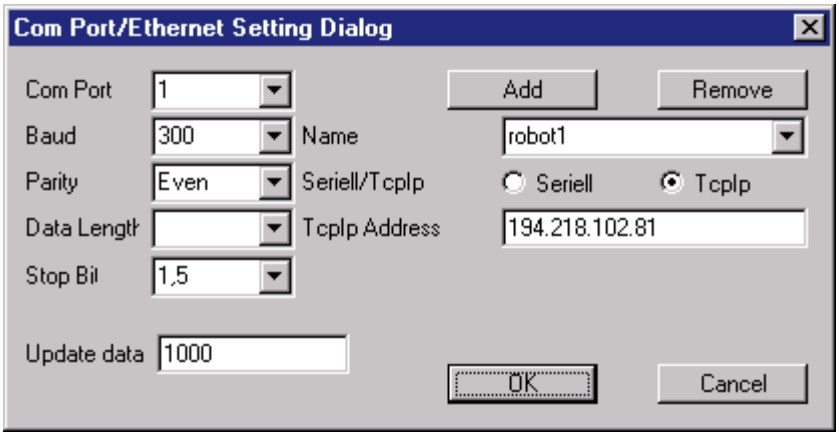


Fig.15 Port setting menu

c) Choose parameters for the robot (see above)

d) Name the robot, for example Robot 1

e) Choose Serial or TCP/IP.

f) If you select TCP/IP the robots IP-address has to be entered.

g) In the field *Update data* you tell the program how often update from robot shall take place.
The value is written in time; miliseconds. (1000 milisec = 1 sec).
In this example the update will take place every second.

h) When the settings are ok, click on the **OK-**button.

4. Robot parameters

For communication some parameters in the robot controller has to be set as follows. For changing of SD and FD parameters you have to open the robot controller which is protected by a code.

Contact your MOTOMAN-representative for support.

	ERC	***MRC***	***XRC***
		RS000= (*) Std. port #1	
		RS001= (*) Std. port #2	
Data bit	RS00=8	RS030=8	
Stop bit	RS01=0	RS031=0	
Parity	RS02=0	RS032=0	
Speed	RS03=64	RS033=6	
	RS06=100	RS034=100	
	RS07=255	RS035=255	
	RS08=4	RS036=30	
	RS09=5	RS037=10	
	SD78=1	FD0=1	
	SD110=1	FD1=1	
		FD3=1	
		FD5=1	
		FD7=1	
		FD14=1	
		FD15=1	

*) To run MotoDDE **RS000 or RS001** must be set in value ”**2**” according to the contact you want to use. (Std. port #1 or Std. port #2).
These two parameters must not have the same setting!

Some parameters have to be set under ”Maintenance mode” also.

I/O=	NOT USED
COMMAND=	USED
PP/PBOX=	NOT USED

5. Hardware connection

■ ***ERC***

Connect the 25-pole cable connector to the 25-pole socket underneath the lid at the front of the CRT-panel.

■ ***MRC***

Connect the 25-pole cable connector to the 25-pole socket underneath the lid at the front of the door-panel = **Std. port #1**.

Connect the 9-pole adaptor to the 9-pole socket inside MRC located at MCP01-board = **Std. port #2**.

(*) Settings for parameter RS000 / RS001:

0 = Not used
1 = Printer
2 = Data transmission protocol (PC as host)
3 = FC1 protocol (FDD software)

Hardware key

To be able to run the program it is necessary to apply the hardware key. Mount the hardware key on the parallel port of the PC.

For Windows NT application a parallellport must be installed/created, see Windows NT manual.

■ ***XRC***

.....

6. I/O and IRQ installation

For connection following settings are recommended in the PC.

Port	I/O	IRQ
Com1	03F8	4
Com2	02F8	3
Com3	03E8	5
Com4	02E8	9

Settings of I/O and IRQ are made of the software in Windows, choose **Control panel/ Port.**

6.1 Serial connection

Connection between the PC and the robot controller through serial RS232 interface.

Maximum cable length are 15 meters for every robot controller. It's possible to use short distance modem if the distance is longer.

Com1 and **Com3** are 9-pole plug.

Com2 and **Com4** are 25-pole plug.

Cable layout, see figure.

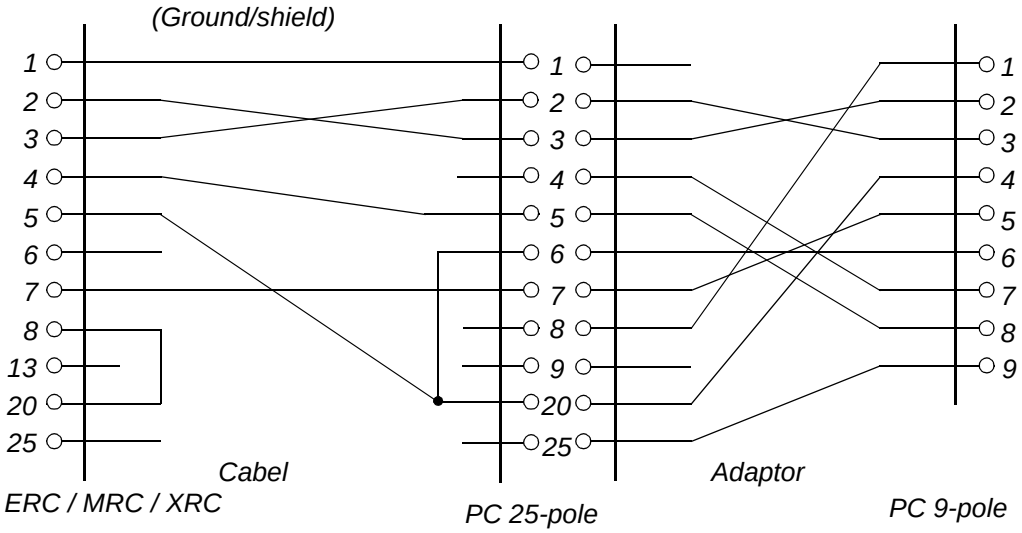


Fig.16 Cabel and adaptor

6.2 Network connection

For information about network connection, see separate manual for Ethernet-connection (only MRC).

7. Program structure

DdeSvr is a DDE-server (Dynamic Data Exchange) software. The program work as a link between a client and ERC/MRC/XRC. DdeSvr control the status of the tags which the user set up in the client program continously. If any of the tags are changed the application software is notified and data is updated. Tags are functions and variables in ERC/MRC/XRC which can be red to, written to or both from external units.

7.1 Files

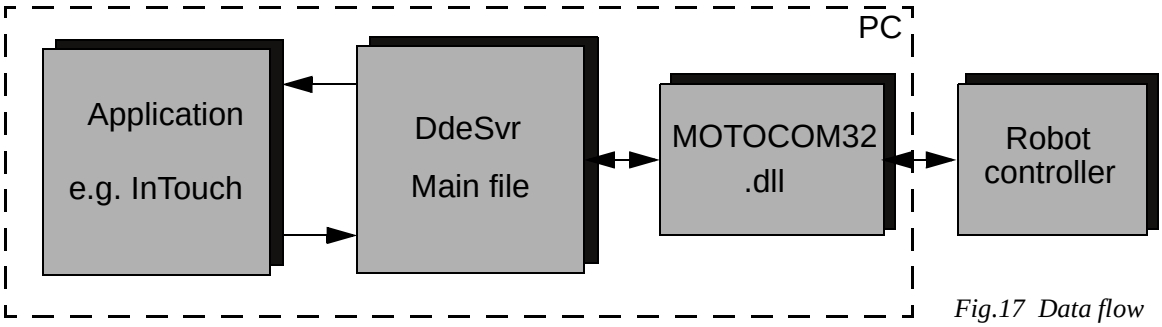


Fig.17 Data flow

MotoDDE consist of one main file communicating with the application software and controlling the functions. The main file is written as a Windows based program. Therefore, the functions and the menus are the same as for Windows.

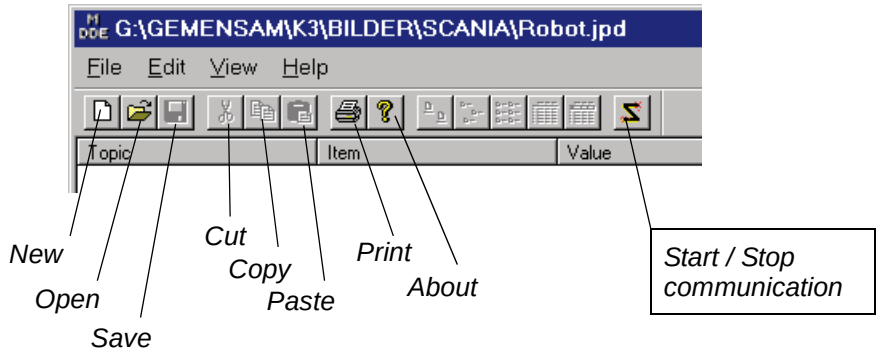
MotoDDE uses the colours set up for Windows, which can be set under the Windows **Control panel**.

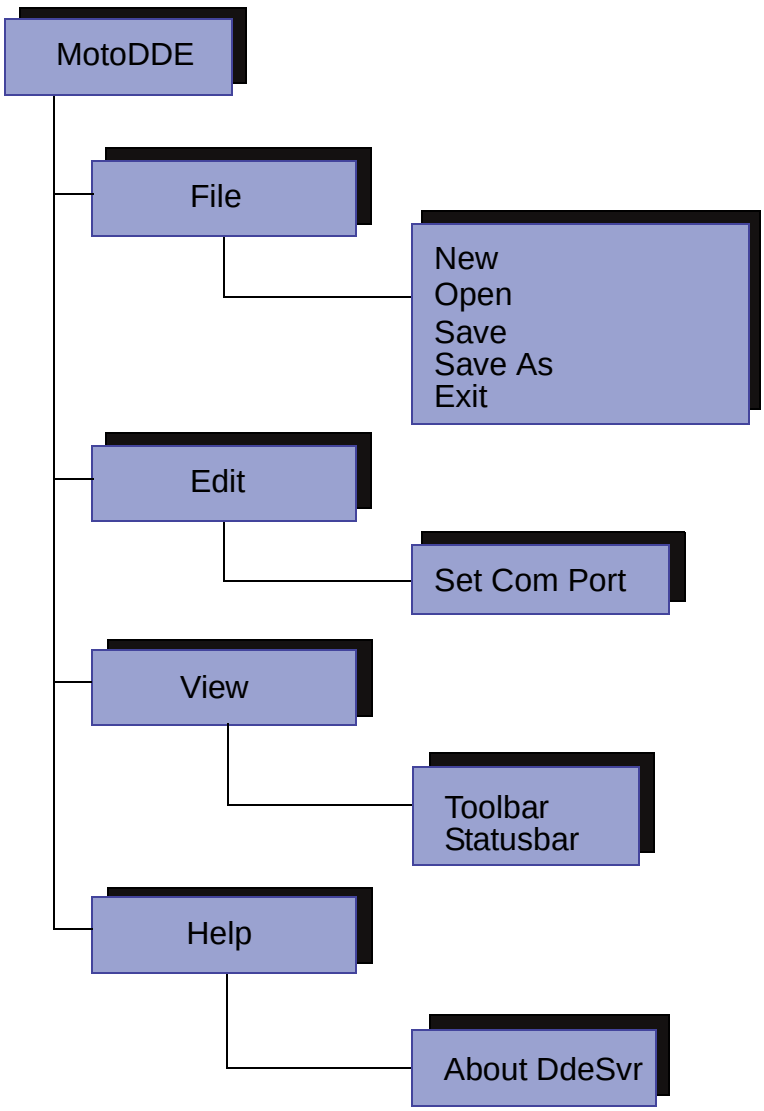
MotoDDE also contains a Dll-file whos supervice the communication between the PC and the robot controller, type ERC/MRC/XRC.

7.2 Helpprogram

When MotoDDE runs via Ethernet a help program called: High Speed Link Server is used. This program was installed at the same time as MotoDDE.

7.3 Commands


G:\GEMENSAM\K3\BILDER\SCANIA\Robot.jpd
File Edit View Help
Topic
Item
Value
New
Open
Save
Cut
Copy
Paste
Print
About
Start / Stop communication


MotoDDE
File
New
Open
Save
Save As
Exit
Edit
Set Com Port
View
Toolbar
Statusbar
Help
About DdeSvr

8. Program running

The MotoDDE-program is activated and runs in the background. MotoDDE is used like a “translator” between the application program and the MOTOMAN-robot.

8.1 Start

MotoDDE activates and runs by the application program.

a) Start the program by double-click on the icon, the start menu is shown, (Fig. 1).

b) Click on **Open** and inform which file with settings of file transfer you are going to use, for more information about the file system, see Windows manual.

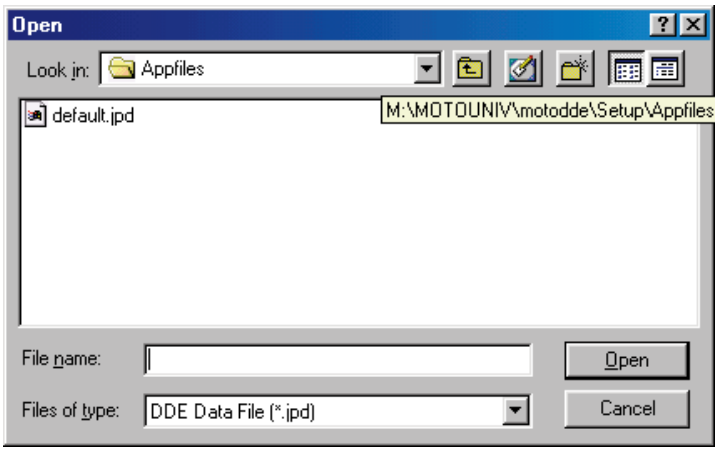


Fig.18 Choose file

c) Set the robot in **REMOTE**-mode.

d) Start **High Speed Link Server** (only at network!).

e) Minimize HSLS (only at network!).

f) Start the communication by double-click on the **Z**-button.

g) Now MotoDDE can be minimized.

h) Start the application program, e.g. InTouch.

8.2 Stop

a) Stop the communication by clicking on the **Z**-button again.

b) Finish HSLS.

c) Finish MotoDDE.

9. Tags to server

Following tags, items, are available in the DDE-server with name if any are able to read or write or both, together with comments about the function.

SERVO	Read/Write	Read: Indicates whether voltage is supplied for the servo's. Write: Turns servovoltage ON when item is set to 1. Turns off servo voltage when item is set to 0. Write only applies for XRC.
JOBNAME	Read	Read: Get name of the selected job.
PLAY-MODE	Read/Write	Read: Indicates if the robot is in Play mode. Write: Sets robot in Play mode when item is set to 1. When item is set to 0 no change is applied.
MODE-TEACH	Read/Write	Read: Indicates Teach mode. Write: Sets Teach mode when item is set to 1. When item is set to 0 no change is applied.
ALARM	Read	Read: Indicates if any alarm is given in robot.
CYCLELOOP	Read/Write	Read: Indicates if robot is in "Cycle loop". Write: Sets robot in "Cycle loop" when item is set to1. When item is set to 0 no change is applied.
CYCLE-ONE	Read/Write	Read: Indicates if robot is in "One cycle". Write: Sets "One cycle" when item is set to 1. When item is set to 0 no change is applied.
CYCLESTEP	Read/Write	Read: Indicates if robot is in "Cycle step". Write: Sets "Cycle step" when item is set to 1. When item is set to 0 no change is applied.
IO0xxx	Read	Robot universal input. Read: Reads status for I/O bits in the 0000 serie. Xxx must be between 010 and 167.
IO1xxx	Read	Robot universal output. Read: Reads status for I/O bits in the 1000 serie. Xxx must be between 010 and 167.
IO2xxx	Read	Robot external input. Read: Reads status for I/O bits in the 2000 serie. Xxx must be between 010 and 187.
IO3xxx	Read	Robot external output. Read: Reads status for I/O bits in the 3000 serie. Xxx must be between 010 and 187.
IO4xxx	Read	Robot specific input. Read: Reads status for I/O bits in the 4000 serie. Xxx must be between 010 and 167.
IO5xxx	Read	Robot specific output. Read: Reads status for I/O bits in the 5000 serie. Xxx must be between 010 and 247.
IO6xxx		Timer/Counter. Present status: neither Read nor Write. Xxx must be between 010 and 047.
IO7xxx	Read	Auxilary relay. Read: Reads status for I/O bits in the 7000 serie. Xxx must be between 010 and 327.
IO80xx	Read	Control status signals. Read: Reads status for I/O bits in the 8000 serie. Xx must be between 10 and 87.
IO82xx	Read	Psuedo input signals. Read: Reads status for I/O bits in the 8200 serie. Xx must be between 10 and 47.

IO9xxx	Read/Write	Network input. Read: Reads status for I/O bits in the 9000 serie. Write: Sets new status for I/O bits. Xxx must be between 010 and 167.
BYTExxx	Read/Write	Read: Reads value on byte variable. Write: Sets new value on byte variable. Xxx must be between 000 and 999.
INTxxx	Read/Write	Read: Reads value on integer variable. Write: Sets new value on integer variable. Xxx must be between 000 and 999.
JOBLINE	Read	Read: Indicates current line in the active job.
JOBSTEP	Read	Read: Indicates current step in the active job.
PULSES xRySz	Read	Read: Reads the pulsenumber for a axis. Axis x can be S,L,U,R,B,T,7,8,9,10,11,12. Y is robotnumber, Z is stationsnumber.
PULSESx	Read	Read: Reads the pulsenumber for a axis. Axis x can be S,L,U,R,B,T,7,8,9,10,11,12. This item is for robot 1 and station 1.
FRAMEBA-SEx	Read	Read: Pulsenumber for för a axis. X can be X,Y or Z.
FRAMETx	Read	Read: Reads the"wrist angle" of the robot in degrees. X can be X,Y or Z.
FRAMEx	Read	Read: Reads the robotposition in XYZ coordinates. X can be X,Y or Z.
HOLD	Read/Write	Read: Indicates "Panel hold" in the robot. Write: Sets robot to "hold" when item is set to 1. When item is set to 0 "hold" is exited.
PANEL-HOLD	Read	Read: Indicates "Panel hold" in robot.
PENDAN-THOLD	Read	Read: Indicates "Programming pendant hold" in robot.
EXTER-NALHOLD	Read	Read: Indicates "External hold" in robot.
COM-MAND-HOLD	Read	Read: Indicates "Command hold" in robot.
START	Read/Write	Read: 1 indicates that the robot is running. Write: When item is set to 1 the selected job starts from the beginning. When item is set to 0 no change is applied.
CONTINUE	Write	Write: The robot continues from the current jobline when item is set to 1
PLAYSTOP	Read	Read: Indicates if the robot is stopped.
PLAYBACK	Read	Read: Indicates if the robot is running with normal velocity.
PLAYSPE-CIAL	Read	Read : Indicates if the robot is running with safe velocity.
ALARMDA-TAx	Read	Read: Up to 4 alarm codes. Integer. 0 if no alarm. X can be between 0 and 3.
COMMUNI-CATION ERROR	Read	Read: 1 indicates communication-error between the robot and the PC , otherwise 0.

10. Client software

10.1 Application software

Following application software can be used together with MotoDDE:

Brand*	Manufacturer
InTouch	Wonderware Inc.
FactoryLink	USDATA Corporation
Citect	Ci Technologies Pty ltd
Fix	Intellution Inc.

*) Product name are registered trademarks by the manufacturer.

10.2 Client connection

The DDE server has applicationname"MotoDde"

DDE client topic shall be set to the same name as DDE server robot name. (e.g. Robot 1).

11. Trouble shooting

Following error messages can appear in MotoDDE.

Communication fail

If these messages appears;

- ✔ Check the communication and network.
- ✔ Check the parameter setting in MotoDDE and in ERC/MRC/XRC.
- ✔ Check that the robot is set in **REMOTE**-mode.

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